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A REVISION OF THE RACES OF TOXOSTOMA
REDIVIVUM (GAMBEL).

BY HARRY C. OBERHOLSER.

FOUR forms of *Toxostoma redivivum* have been described, but at present only one is generally recognized. Both Mr. Robert Ridgway and the writer have hitherto failed to distinguish more than a single race, which we have considered coextensive with the species; but this failure now proves to have been due to lack of proper material. Dr. Joseph Grinnell, however, has recently allowed three subspecies in California.¹ The identification of newly collected material in the Biological Survey has led me to a reëxamination of the entire species. For this purpose a very satisfactory number of specimens has been available, altogether 385, including the type and type series of *Toxostoma redivivum sonomæ* Grinnell, also the types of *Toxostoma redivivum redivivum*, *Toxostoma redivivum pasadenense*, and *Toxostoma redivivum helvum*. For the use of these and much additional material the writer is under obligation to the authorities of the United States National Museum, the Academy of Natural Sciences of Philadelphia, the American Museum of Natural History, and the Museum of Comparative Zoölogy; to Mr. John E. Thayer, Mr. William Brewster, Mr. A. C. Bent, Dr. Joseph Grinnell, Dr. J. Dwight, and Dr. L. B. Bishop. With these advantages it is now possible to recognize, instead of a single form, three fairly well defined geographic races, which are explained in the following paragraphs:

***Toxostoma redivivum redivivum* (Gambel).**

Harpes rediviva GAMBEL, Proc. Acad. Nat. Sci. Phila., II, No. 10, August, 1845, p. 264 (near Monterey, California).

Harporyhynchus redivivus pasadenensis GRINNELL, Auk, XV, No. 3, July, 1898, p. 237 (Pasadena, California).

¹ Pacific Coast Avifauna, No. 11, October 21, 1915, pp. 154-155; 'The Auk,' XXXIV, No. 4, October, 1917, pp. 427-433.

CHARS. SUBSP.—Brown of upper parts decidedly grayish; white of throat with little or no tinge of buffy; brown jugular band dark and grayish; buffy ochraceous of posterior lower parts pale.

MEASUREMENTS.—Male:¹ wing, 94–106.5 (average, 100.6) mm.; tail, 117–138 (128.1); exposed culmen, 32–39 (36.2); tarsus, 36.5–40 (38.1); middle toe without claw, 22–26 (24.3).

Female:² wing, 93–105.5 (average, 98.9) mm.; tail, 124–130 (126.9); exposed culmen, 33.5–39 (36.1); tarsus, 35.5–39 (37.2); middle toe without claw, 22.5–25.5 (23.8).

TYPE LOCALITY.—Near Monterey, California.

GEOGRAPHIC DISTRIBUTION.—Central northern Lower California, and southern California excepting the southeastern part and the coast region north of Monterey Bay. Resident in the Upper Austral and to some extent the Lower Austral zones, north to Amador (Amador County) in California, Sacramento, and Grafton (northeastern Yolo County); west to Brentwood (Contra Costa County), Monterey, Santa Barbara, Laguna Beach (Orange County), San Diego, and the Mexican Boundary Line at the Pacific Ocean; south to extreme southwestern San Diego County, Campo, and Cameron Ranch (San Diego County) in California, and Hanson Laguna, Lower California; east to Jacumba (southwestern Imperial County) in California, Palm Springs (Riverside County), Hesperia (San Bernardino County), Piute Mountains (Kern County), Weldon (Kern County), East Fork of Kaweah River about 10 miles west of Mineral King (Tulare County), Fresno Flat (Madera County), Coulterville, and Murphy (Calaveras County).

Remarks.—The subspecific separation of the birds of this species living in southern California from those inhabiting the coast region north of Monterey Bay was first made by Dr. Joseph Grinnell.³ From our present investigations it is evident that this distinction is easily maintainable, although it must be noted that none of the characters are wholly constant, on account of the great amount of individual variation in both races. Birds in juvenal plumage are, furthermore, almost as readily distinguishable as those in the adult stage; the juveniles of the present form being decidedly less ochraceous on the under parts and somewhat less rufescent above than the young of *Toxostoma redivivum sonomae*.

¹ Ten specimens, from California.

² Ten specimens, from California.

³ *Harporhynchus redivivus pasadenensis* Grinnell, Auk, XV, No. 3, July, 1898, p. 237 (Pasadena, California).

Dr. Grinnell, in describing his *Harporhynchus redivivus pasadenensis*, considered that the bird inhabiting the southern side of Monterey Bay, including the type locality of *Toxostoma redivivum redivivum*, was the same as that of the southern shore of San Francisco Bay, and thus, by inclusion of the type, made the northern bird the typical race. A recent careful examination of Gambel's type of *Harpes rediviva*, which is now in the Academy of Natural Sciences at Philadelphia, shows that this arrangement apparently needs revision. This type is an old specimen, which was for a long time mounted and thus exposed to the light, and has consequently become somewhat discolored, particularly on the upper parts. Except for its more brownish upper surface, which is apparently due to this discoloration, it is in all respects readily matched by many of our large series of birds from southern California; and although it shows a slight vergence toward the northern race, its whitish throat, dark breast, and pale under parts leave no doubt of its correct identification with the race from southern California, called by Dr. Grinnell *Harporhynchus redivivus pasadenensis*. This identification of Gambel's type specimen is fortified by a series of adult and young birds from Seaside, California, which is situated on the southeastern shore of Monterey Bay but a short distance east of Monterey. These examples, while showing a slight inclination toward the northern subspecies, are very much nearer the southern form. It is evident, therefore, that the name *Toxostoma redivivum redivivum* must be transferred to the southern race, to displace *Toxostoma redivivum pasadenense* (Grinnell), while another name must be found for the bird now known as *Toxostoma redivivum redivivum*. Adult specimens from Paso Robles, in San Luis Obispo County, and from Jolon, in Monterey County, are also clearly referable to this race, since they are not distinguishable from many southern California specimens. The same remarks are applicable to our juvenal examples from Paraiso Springs in Monterey County. Birds from Chinese in Calaveras County, Brentwood in northeastern Contra Costa County, and Amador in Amador County, vary slightly toward the northern subspecies, *Toxostoma redivivum sonomae*, but belong clearly to the present form. A series of both juvenal and adult birds from Campo, Jacumba, Cameron Ranch, and Pine Valley,

all these localities situated along the Mexican border of southern California, are in characters about half way between *Toxostoma redivivum redivivum* and *Toxostoma redivivum helvum* of Lower California, but on the whole seem to be rather nearer the California race. A single adult in fresh plumage from Chulavista, in southwestern San Diego County, California, and a large series from Witch Creek, California, are more clearly referable here.

One hundred and seventy-five specimens of this race have been examined, from the following localities:

California.—Seaside, Monterey County (June 26, 28, 29, and 30, 1909); Santa Paula (April 8, 1880); Paso Robles, San Luis Obispo County (Sept. 2, 1902); Los Alamos, Santa Barbara County (Nov. 4, 1884); Pasadena (Jan. 15, 1909; Feb. 6, 1897; Sept. 5, 1909; Dec. 26, 1896); Whitewater, Riverside County (Sept. 12, 1907) Jolon, Monterey County (Oct. 4, 1884); San Gabriel Wash, Los Angeles County (Oct. 17, 1915); Heninger Flats, San Gabriel Mountains (July 4 and 8, 1905); San Fernando (Nov. 3 and 13, 1902; Oct. 29, 1915); Placerita Canyon, Los Angeles County (Nov. 28, 1915; Dec. 10, 1915); Stanley, Kings County (June 30, 1907; July 1, 1907); Saticoy (Feb. —, 1872); Chinese, Calaveras County (Sept. 26, 1901); Fullerton, Orange County (Nov. 15, 1900); Amador (April 26, 1896); Brentwood, Contra Costa County (Dec. 21, 1907); Kernville (July 11, 1891); Santa Barbara (Jan. 10, 1875); Fort Tejon; Raymond, Madera County (June 29, 1904); Palm Springs, Riverside County (June 11, 1907); Paraiso Springs, Monterey County (April 16, 1881; July 19, 1902); Grafton, northeastern Yolo County (1877; July 28, 1906); Eshom Valley, Tulare County (August 29, 1907); 4 miles east of Cuyama Ranch, Cuyama Valley, San Luis Obispo County (June 27, 1916); Los Angeles (May 10, 1915); Jacumba, Imperial County (Feb. 9, 1903; May 19, 21, and 22, 1894); Witch Creek, San Diego County (Jan. 7, 1908; Jan. 2, 1907; Jan., 1893; Jan. 14, 1904; Feb. 1, 1904; May 7, 1904; July 22 and 28, 1911; July 14 and 26, 1904; August 1, 2, 4, and 23, 1911; August 8, 10, 18, 19, 22, and 26, 1904; August 9, 1913; August 12 and 20, 1912; Sept. 2, 1911; Sept. 26, 1913; Oct. 11, 12, 13, 17, and 27, 1906; Nov. 20, 1903; Nov. 20, 1906; Nov. 24, 1904; Dec. 13, 1909; Dec. 30, 1904); San Diego (Feb. 5, —; Feb. 18, 1893; March 2, 1894; spring, 1874; April

20, 26, and 28, 1894; May 3, 7, and 17, 1894; Dec. 17, 1884; Dec. 22, 1906); Riverside (Jan. 6, 1887; Jan. 19 and 28, 1888; March 19, 1887; April 5, 1887; May 7 and 8, 1887; Sept. 10, 14, and 28, 1881; Sept. 27, 1888; Oct. 6, 1883); Escondido (June 16, 1897); Sacramento; Santa Ysabel (Dec. 25, 1892); Paicines, San Benito County (June 14, 1903); San Bernardino (March 30, 1882; Jan. 18, 1884; Sept. 10, 1888; April 26, 1882); San Bernardino Valley (Oct. 2 and 6, 1893); San Bernardino County (Dec. 25, 1877); Lankershim, San Fernando Valley, Los Angeles County (Jan. 30, 1917); Los Nogales, San Fernando Valley, Los Angeles County (Feb. 9, 1917; May 16, 1917); Redlands (Feb. 13 and 25, 1903; Jan. 3 and 30, 1903; March 11 and 21, 1903; Nov. 24, 1902; Dec. 29, 1902); Highland Park, Los Angeles County (Jan. 31, 1903); Los Angeles County (Dec. 14, 1906); Tejunga Wash, Los Angeles County (Sept. 10, 1890); Dulzura (March 15, 1894; May 13, 1892; June 3, 1891; June 9, 1890; August 1, 1889; Oct. 15, 1891); Kern County (May 29, 1907); Monterey County (June 12, 1903); Banta, San Joaquin County (May 25, 1896); Ocean Beach, near Mexican Boundary Line, San Diego County (August 17, 1894); Chulavista, San Diego County (Sept. 18, 1916); Campo, San Diego County (Feb. 3, 1903); Cameron Ranch, San Diego County (June 22, 1894); Pine Valley, near Mexican Boundary Line, San Diego County (Aug. 8, 1894).

Lower California.—Hanson Laguna, Hanson Laguna Mountains (June 6, 1905).

***Toxostoma redivivum sonomae* Grinnell.**

Toxostoma redivivum redivivum AUCT. (nec Gambel).

Toxostoma redivivum sonomae GRINNELL, Pacific Coast Avifauna, Nq. 11, October 21, 1915, p. 155 (one mile west of Guerneville, Sonoma County, California).

CHARS. SUBSP.—Similar to *Toxostoma redivivum redivivum*, but brown of upper parts more rufescent (less grayish); upper throat and chin more washed with buff; jugular band more buffy (less grayish) and not so dark; buffy ochraceous of posterior lower parts darker.

MEASUREMENTS.—Male:¹ wing, 97–107 (average, 103.2) mm.; tail,

¹ Thirteen specimens, from California.

122–140 (132.7); exposed culmen, 32–39.5 (36.2); tarsus, 37–41.5 (39.1); middle toe without claw, 23.5–26.5 (25.0).

Female:¹ wing, 97–103.5 (average, 100) mm.; tail, 125–136 (131.9); exposed culmen, 34–37 (35.2); tarsus, 36–40 (38.1); middle toe without claw, 24–26.5 (25.5).

TYPE LOCALITY.—One mile west of Guerneville, Sonoma County, California.

GEOGRAPHIC DISTRIBUTION.—Northern and central western California. Resident in the Upper Austral Zone and to a slight extent in the Lower Austral Zone, north to Baird (Shasta County), Stillwater (Shasta County), and Covelo (Mendocino County); west to Olinda (Shasta County), Cahto (Mendocino County); Ukiah (Mendocino County); Guerneville (Sonoma County), Freestone (Sonoma County), Marin County, San Francisco, Pescadero, and Santa Cruz; south to Santa Cruz, and in the Sacramento Valley to Marysville Buttes (Sutter County) and Folsom (Sacramento County); east to Los Gatos, San Jose, Berryessa, Santa Clara, Berkeley, Vacaville (Solano County), Rumsey (northwestern Yolo County), Placerville (Eldorado County), Wheatland (Yuba County), Nevada County, and Tehama.

Remarks.—As are all the forms of the species, the present one is subject to much individual variation, and the characters that separate it from *Toxostoma redivivum redivivum* and *Toxostoma redivivum helvum* are, strictly speaking, only average, although it is a race well worthy of recognition. This individual variation shows mostly on the jugulum, abdomen, and upper parts. Very badly worn specimens are sometimes difficult to distinguish from birds of the other races in similar condition. An example from Folsom, Sacramento County, (No. 82575, U. S. Nat. Mus.) is in perfect, fresh, fall plumage, and shows not the slightest indication of intergradation with *Toxostoma redivivum redivivum*.

The thrashers of this species occupying the upper Sacramento Valley and that part of the coast region lying north of San Francisco Bay have been recently separated by Dr. Joseph Grinnell² as a subspecies distinct from those inhabiting the coast region from San Francisco Bay south to Monterey Bay, which, as above noted, he considers true *Toxostoma redivivum redivivum*. With the type series of this additional northern race in hand, together with a

¹ Seven specimens, from California.

² *Toxostoma redivivum sonomæ* Grinnell, Pacific Coast Avifauna, No. 11, October 21, 1915, p. 155 (one mile west of Guerneville, Sonoma County, California).

considerable number of specimens not examined by Dr. Grinnell, I am unable to discover any differences sufficiently constant or distinctive to warrant the recognition of an additional subspecies. It is true that comparison with only Dr. Grinnell's type series indicates the existence of the two forms, although even this is not very satisfactory; but when our series is combined with his it is apparent that there is not sufficient difference in even average characters to maintain the distinction. Not 50 per cent of the specimens from northern California can be separated by the color of the jugulum, flanks or upper parts, or, so far as I can see, by any other character, from those of the coast region south of San Francisco Bay; and while there is a slight average difference in the birds from these two areas, it is due largely to a few very gray examples in the type series, and is really so slight and inconstant as to be worthless for subspecific differentiation. Neither does a series of juvenal specimens of both these supposed races show any differences between them, as should be the case were the distinction tenable. Individual variation among the birds from north of San Francisco Bay is very great, and the most rufescent as well as the most grayish of the entire series, including those from south of this bay, are among the specimens from the north. Our examination is based primarily on birds in freshly moulted condition, as the aspect of the plumage changes greatly by any considerable amount of wear, and it is therefore difficult to predicate subspecific separations on worn birds. Furthermore, there is no satisfactory difference in measurements, as the table of measurements (p. 59) will show.

It is, as thus explained, necessary to unite the birds from north of San Francisco Bay, described by Dr. Grinnell as *Toxostoma redivivum sonomæ*, with the birds from the coast region south of this bay, called by him *Toxostoma redivivum redivivum*. Since, furthermore, the name *Toxostoma redivivum redivivum* is, as above shown, properly applicable to the southern bird heretofore called *Toxostoma redivivum pasadenense*, the name *Toxostoma redivivum sonomæ* Grinnell becomes necessarily the name for the northern subspecies as now defined.

Seventy-three specimens of this race have been examined, from the localities given below:

California.—Palo Alto, Santa Clara County (April 17, 1898;

Locality.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe without claw.
Nine males from north of San Francisco Bay.					
Minimum	97.0	122.0	32.0	37.0	23.5
Maximum	106.5	140.0	39.0	41.0	26.5
Average	102.4	132.7	36.2	39.1	25.0
Four males from south of San Francisco Bay.					
Minimum	104.0	127.0	36.0	38.5	25.0
Maximum	107.0	134.0	39.5	41.5	26.5
Average	105.0	129.6	37.0	39.8	25.5
Five females from north of San Francisco Bay.					
Minimum	97.0	128.0	34.0	37.0	24.0
Maximum	103.5	136.0	37.0	40.0	26.5
Average	100.0	133.5	35.4	38.1	25.5
Two females from south of San Francisco Bay.					
Minimum	100.0	125.0	34.5	36.0	25.0
Maximum	100.0	132.5	34.5	38.5	26.0
Average	100.0	128.7	34.5	37.2	25.5

July 15, 1904; June 3, 1898; March 13, 1898; Dec. 31, 1896); Santa Clara (June 25, 1875); San Francisco (winter); Presidio, near San Francisco; Stanford University (June 1, 6, and 8, 1900; Oct. 4, 1897); Round Valley, Mendocino County (Sept. 5, 1899); Stillwater, Shasta County (July 6, 1901); Mount George (August 2, 1909); Mount St. Helena (August 29, 1900); Olinda, Shasta County (Nov. 15, 1900); Calistoga, Napa County (Oct. 16, 1889); Folsom, Sacramento County (Oct., 1875); Baird (Jan. 3, 1884); Rumsey, Yolo County (June 28, 1912); Freestone, Sonoma County (June 14, 1913); One mile west of Guerneville, Sonoma County (August 29 and 30, 1913); Marysville Buttes (3 miles northwest of Sutter, Sutter County) (April 6, 1912); three miles south of Covelo, Mendocino County (July 21, 24, 25, and 26, 1913); near summit of Mount Sanhedrin, Mendocino County (August 17, 1913);

three miles west of Vacaville, Solano County (July 4 and 5, 1912); Berryessa (Jan. 22, 1889; April 11, 1896); Oakland (Feb. 24, 1881); Santa Cruz (July 8, 1896; August 31, 1895; Oct. 19, 1895; Nov. 25, 1895; Dec. 17, 1895); Santa Cruz County (Dec. 14, 1899); Big Trees, Santa Cruz County (May 15 and 18, —); Contra Costa; Berkeley, Alameda County (Feb. 20, 1898; March 22, 1897; April 10, 1897; Nov. 26, 1897); Claremont Canyon, near Berkeley (July 14, 1917); Pescadero (Sept., 1889); Los Gatos (Feb. 14, 1894; Oct. 22, 1894); La Honda, San Mateo County (March 24, 1896); Menlo Park, San Mateo County (Jan., 1896; Dec. 17, 1895); Portola, San Mateo County (Dec. 31, 1895); Cedro Cottage, San Mateo County (Jan. 17, 1903); Black Mountain, Santa Clara County (June 4, 1904; August 29, 1904); Nevada County (Sept. 25, 1887); Snow Mountain, Colusa County (June 3, 4, and 12, 1896).

***Toxostoma redivivum helvum* Thayer and Bangs.**

Toxostoma rediviva helva THAYER AND BANGS, Proc. New Engl. Zool. Club, IV, Apr. 30, 1907, p. 17 (Rosario, Lower California).

CHARS. SUBSP.—Similar to *Toxostoma redivivum redivivum*, but jugular band paler, less grayish (more washed or tinged with buffy); throat more deeply buffy (less whitish); flanks usually more brownish (less grayish); and remaining lower parts somewhat more deeply and brightly ochraceous.

MEASUREMENTS.—Male:¹ wing, 97–103 (average, 100.5) mm.; tail, 130–142 (137); exposed culmen, 33.5–36 (34.7); tarsus, 31–38 (35.8); middle toe without claw, 22.5–25 (23.9).

Female:² wing, 95–99 (average, 97) mm.; tail, 127–135 (131); exposed culmen, 32.5; tarsus, 35–37 (36); middle toe without claw, 23.5–24 (23.7).

TYPE LOCALITY.—Rosario, 30° N. Lat., Lower California.

GEOGRAPHIC DISTRIBUTION.—Resident in the Lower and Upper Austral zones of northwestern Lower California, north to the San Pedro Martir Mountains, northern Lower California, and Ensenada; west to Ensenada, Santo Domingo (northeast of San Quintin), San Simon, and Rosario, Lower California; south to Rosario and San Fernando (30° N. Lat.); and east to San Fernando and the San Pedro Martir Mountains.

¹ Seven specimens, from Lower California and California.

² Two specimens, from Lower California.

Remarks.—Although this race, hitherto unrecognized, except by its original describers, is confined to a comparatively limited area, it is apparently well worthy of subspecific status. Even birds in juvenal plumage are, at least in series, distinguishable from those of *Toxostoma redivivum redivivum*, as they are more deeply ochraceous below and more rufescent above; in fact, the present race, on the whole, as much resembles *Toxostoma redivivum sonomæ* as it does the adjacent and intervening *Toxostoma redivivum redivivum*, but it is distinguishable from the former by its decidedly more brownish (less grayish) and paler jugular band, less rufescent (more grayish) upper surface, and lighter posterior lower parts. This close similarity to *Toxostoma redivivum redivivum*, together with the fact that its characters were not quite correctly stated in the original description, doubtless account in large measure for the failure of subsequent authors to recognize it as distinct. We take pleasure therefore in being able to restore it to good standing among its relatives. The very extensive series that we have examined shows the paleness and brownish cast of the jugular band to be very constant, and, indeed, the best character for separation from *Toxostoma redivivum redivivum* or *Toxostoma redivivum sonomæ*.

One hundred and thirty-seven specimens of this subspecies have been examined, from the following localities:

Lower California.—Ensenada (Feb. 27, 1906; May 18, 1905); Laguna Ensenada (April 5, 1910); San Fernando (Sept. 4, 1905); Santo Domingo, 25 miles northeast of San Quintin (August 19, 1905); 45 miles east of San Quintin (Jan. 20, 1894); San Simon (Oct. 22, 1903); Rosario (Oct. 25, 27, 28, 29, and 30, 1906; Nov. 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 28, and 29, 1906).